What is claimed is:

[Claim 1] A borehole caliper tool, comprising:

a tool body;
a bow spring flexibly coupled to the tool body;
a target coupled to the bow spring; and
an ultrasonic transducer coupled to the tool body, wherein in operation the ultrasonic transducer transmits an acoustic pulse to the target and receives an echo of the acoustic pulse from the target.

[Claim 2] The borehole caliper of claim 1, wherein the target is attached to the bow spring.

[Claim 3] The borehole caliper of claim 1, further comprising a rigid arm coupled to the tool body and the bow spring such that the rigid arm deflects relative to the tool body as the bow spring flexes.

[Claim 4] The borehole caliper of claim 3, wherein the target is attached to the rigid arm.

[Claim 5] The borehole caliper tool of claim 3, wherein a pivot joint is formed between the rigid arm and the tool body.

[Claim 6] The borehole caliper tool of claim 5, wherein a pivot joint is formed between the rigid arm and the bow spring.

[Claim 7] The borehole caliper tool of claim 6, wherein a sliding joint is formed between the rigid arm and the bow spring.

[Claim 8] The borehole caliper of claim 1, further comprising means for measuring a sonic velocity of a fluid.

[Claim 9] The borehole caliper of claim 1, wherein the means for measuring the sonic velocity comprises an ultrasonic transducer with a fixed length acoustic travel path.

[Claim 10] The borehole caliper of claim 1, wherein the ultrasonic transducer is mounted in a cavity in the tool body.

[Claim 11] The borehole caliper of claim 1, wherein the target and ultrasonic transducer are positioned such that they are in opposing relation during operation.

[Claim 12] A borehole caliper tool, comprising:

a tool body;
a bow spring disposed on the tool body;
an ultrasonic transducer coupled to the bow spring; and
an ultrasonic transducer coupled to the tool body, wherein in operation an acoustic pulse is transmitted from one of said ultrasonic transducers for receipt by the other ultrasonic transducer.

[Claim 13] The borehole caliper of claim 12, further comprising means for measuring a sonic velocity of a fluid.

[Claim 14] The borehole caliper of claim 12, wherein the two ultrasonic transducers are positioned such that they are in opposing relation during operation.

[Claim 15] The borehole caliper of claim 12, wherein the ultrasonic transducer coupled to the tool body is adapted to transmit an acoustic pulse to the ultrasonic transducer coupled to the bow spring.

[Claim 16] A method for gauging a diameter of a borehole, comprising:

deploying a borehole caliper tool in the borehole, the borehole caliper tool comprising a tool body, a bow spring flexibly coupled to the tool body, a target coupled to the bow spring, and an ultrasonic transducer coupled to the tool body, the borehole caliper tool being deployed such that the bow spring engages with a surface of the borehole; and
generating an acoustic pulse using the ultrasonic transducer;
receiving an echo of the acoustic pulse from the target;
determining a time elapsed between generating the acoustic pulse and receiving the echo of the acoustic pulse; and
relating the time elapsed to the diameter of the borehole.

[Claim 17] The method of claim 16, further comprising estimating a sonic velocity of a fluid in the borehole.

[Claim 18] A method for gauging a diameter of a borehole, comprising:

deploying a borehole caliper tool in the borehole, the borehole caliper tool comprising a tool body, a bow spring flexibly coupled to the tool body, an ultrasonic transducer coupled to the bow spring, and an ultrasonic transducer coupled to the tool body, the borehole caliper tool being deployed such that the bow spring engages with a surface of the borehole; and
generating an acoustic pulse using the ultrasonic transducer coupled to the tool body;
receiving the acoustic pulse using the ultrasonic transducer coupled to the bow spring;
determining a time elapsed between generating the acoustic pulse and receiving the acoustic pulse; and
relating the time elapsed to the diameter of the borehole.

[Claim 19] The method of claim 18, further comprising estimating a sonic velocity of a fluid in the borehole.

[Claim 20] A method for gauging a diameter of a borehole, comprising:

deploying a borehole caliper tool in the borehole, the borehole caliper tool comprising a tool body, a bow spring flexibly coupled to the tool body, an ultrasonic transducer coupled to the bow spring, and an ultrasonic transducer coupled to the tool body, the borehole caliper tool being deployed such that the bow spring engages with a surface of the borehole; and
generating an acoustic pulse using the ultrasonic transducer coupled to the tool bow spring;
receiving the acoustic pulse using the ultrasonic transducer coupled to the tool body;
determining a time elapsed between generating the acoustic pulse and receiving the acoustic pulse; and
relating the time elapsed to the diameter of the borehole.

[Claim 21] The method of claim 20, further comprising estimating a sonic velocity of a fluid in the borehole.